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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,259	05/31/2006	Baumgart Hubert	PAT-01084	6541
26922	7590	02/03/2009	EXAMINER	
BASF CORPORATION Patent Department 1609 BIDDLE AVENUE MAIN BUILDING WYANDOTTE, MI 48192			BERMAN, SUSAN W	
			ART UNIT	PAPER NUMBER
			1796	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/552,259	Applicant(s) HUBERT ET AL.	
	Examiner /Susan W. Berman/	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-19 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-19 and 25-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12-12-08</u> | 6) <input type="checkbox"/> Other: _____ |

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed, short and concise. The title as filed is considered to be too general in description because innumerable “mixtures” contain photoinitiators. The title should mention that a photoinitiator or combination of photoinitiators is mixed with an isocyanate compound and is useful in a coating composition.

Claim Rejections - 35 USC § 112

Claims 1-3, 5-19 and 25-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The examiner has not found a teaching within the specification as filed to use a combination of photoinitiators wherein a unimolecular-type initiator and a bimolecular type initiator are required in the combination. It is agreed that Example “C1” in the Table on page 37 includes 3 different initiators selected from the type I and type II initiators taught on page 10. However, this Example is a comparative example according to page 36, line 12, not an example according to the instantly claimed invention. It appears that Example II in the Table on page 39 comprises an isocyanate and three different photoinitiators. However, the examiner has not found any disclosure of the chemical name or structure of the commercial photoinitiator “Genocure® MBF” in the specification so it is not clear whether it is a type I or type II initiator according to applicant’s definitions. In any case, it is the examiner’s position that one Example does not

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provide basis with sufficient specificity for the limitation set forth in the amended claims 1, 14 and 19.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3, 5-19 and 25-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant's description of unimolecular (type I) and bimolecular (type II) photoinitiators does not appear to be in conformance with art recognized definitions of unimolecular type photoinitiators and bimolecular type photoinitiators and in, thus, confusing. The initiators listed as "unimolecular" are art recognized as "bimolecular" and vice-versa. See the following Patent references: Howard (4,188,455) teaches such that photosensitizers, such as benzophenone, promote free radical addition polymerization through bimolecular photochemical reactions and that photoinitiators, such as phenyl ketones and benzoin ethers, generate free radicals by a unimolecular scission (column 10, line 8, to column 11, line 57). Gruber (4,017,652), referred to by Howard '455, also teaches the photocatalyst system comprising a combination of bimolecular and unimolecular types of initiators. Blum et al (6,780,897) disclose that Norrish type II photoinitiators include benzophenones, benzoin ethers, benzoin ethers and phosphine oxides, in column 21, lines 46-57. Bolte et al (6,482,869) disclose Norrish type I fragmenting photoinitiators that include benzophenone, Irgacure 184 and acylphosphine oxides, in column 11, line 43, to column 12, line 27.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-19, 25, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hovestadt et al (6,335,381) in view of Howard (4,188,455).

Hovestadt et al disclose an isocyanate-functional mixture with a photoinitiator and a two component system comprising the mixture and an isocyanate-reactive component. See Example 3. The urethane acrylate Component I contains free isocyanate groups. Component II comprises a polyacrylate having hydroxyl groups and no photoinitiator. Hovestadt et al teach that component I can also contain a further polyisocyanate. Hovestadt et al teach that mixtures of different types of the disclosed UV initiators are suitable for use in the disclosed compositions (column 4, lines 23-28). The difference from the instant claims is that Hovestadt et al do not specifically teach a mixture of unimolecular photoinitiators with bimolecular photoinitiators.

Howard discloses unsaturated polyurethane compositions comprising a photocatalyst system comprising a compound that permits free radical polymerization through bimolecular photochemical reactions such as hydrogen abstraction and a compound that generates a radical pair by photoinitiated unimolecular homolysis (column 3, line 1, to column 4, line 13, column 8, line 60, to column 9, line 11, and column 10, lines 8-35). Photochemical bimolecular initiators, i.e. photosensitizers, are taught in column 10, lines 36-47. Unimolecular photoinitiators are

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taught from column 10, line 48, to column 11, line 45. Preferred systems comprise mixtures of benzophenone with benzoin isobutyl ether or benzophenone with 2,3-diethoxyacetophenone (column 11, lines 54-57, and the examples). The photocatalyst system taught by Howard allows photopolymerization in the presence of air.

It would have been obvious to one skilled in the art at the time of the invention to employ the photocatalyst system taught by Howard as the photoinitiator in Component I disclosed by Hovestadt et al. It would further have been obvious to one skilled in the art at the time of the invention to employ more than one of the free radical photoinitiators disclosed by either Hovestadt et al or Howard in combination with benzophenone. Hovestadt et al teach that mixtures of different types of the disclosed UV initiators, which include free radical photoinitiators and benzophenone, can be used. Howard teaches that a mixture of bimolecular initiator and unimolecular initiator allow photocuring of unsaturated urethane oligomers in the presence of air. Howard teaches that benzophenone can be combined with different free radical (unimolecular) photoinitiators, thus providing motivation to employ mixtures containing more than one unimolecular-type photoinitiator with the bimolecular-type benzophenone. One skilled in the art at the time of the invention would have been motivated by a reasonable expectation of providing a photocatalyst system comprising mixtures of initiators taught by Hovestadt et al and/or Howard that allows photopolymerization in the presence of air, as taught by Howard.

With respect to claims 12, 16 and 17, although the examples include a diacrylate, Hovestadt et al do not teach that components other than the isocyanate compound are required in component I (see column 2, lines 26-39). With respect to claim 25, dual cure and coating of automotive parts are taught in column 5, lines 27-45. With respect to claim 26, the coatings

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would be expected to be clearcoat coatings because no pigments or fillers are added to the coating compositions.

Claims 1-3, 5-19, 25, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hovestadt et al (6,335,381) in view of Howard (4,188,455), as applied to claims 1-3, 5-19, 25, 26 and 28 above, and further in view of Sumita et al (3,945,833). See the discussion of the disclosures of Hovestadt et al and Howard above. Hovestadt et al and Howard in combination teach photocatalyst combinations of unimolecular photoinitiators such as phenyl ketones, benzil ketals and phosphine oxides, with a bimolecular photosensitizer, such as benzophenone, in mixture with an isocyanate functional ethylenically unsaturated component which is then added to a polyol component and photocured.

Sumita et al disclose a sensitizer comprising a mixture of benzophenone, halogenated benzophenone or a combination thereof and 4,4'-bis(diethylamino)benzophenone that exhibit a synergistic effect when used for photopolymerizing ethylenically unsaturated prepolymers. Additional sensitizers such as benzoin ethers, can be included in the mixture. See column 2, lines 12-64, column 3, lines 23-43. The disclosed synergistic mixture is employed in compositions comprising acrylated epoxies and/or acrylated isocyanates.

It would have been obvious to one skilled in the art at the time of the invention to substitute a mixture of benzophenone sensitizer and amino-functional benzophenone sensitizer, as disclosed by Sumita et al, for the benzophenone bimolecular initiator in the photocatalyst system taught by Hovestadt et al and Howard in combination. One skilled in the art at the time of the invention would have been motivated by a reasonable expectation of taking advantage of

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the synergistic effect noted by Sumita et al in photopolymerization of ethylenically unsaturated prepolymers.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hovestadt et al (6,335,381) and Howard or Howard in combination with Sumita et al, as applied to claims 1-3, 5-19, 25-26 and 28 above, and further in view of Baumgart et al (7,064,165). Hovestadt et al do not mention effect paints or multicoats. Baumgart et al disclose coating materials for multicoat systems comprising components analogous to those instantly claimed. Addition of photoinitiators is taught. The difference is that the photoinitiator is not added to the isocyanate crosslinking component B, as set forth in the instant claims. The compositions are said to be “outstandingly suitable” for multicoat clearcoats (column 19, lines 46-54). It would have been obvious to one skilled in the art at the time of the invention to provide multicoat clearcoats obtained from the coating compositions disclosed by Hovestadt et al, as taught by Baumgart et al. The reason is that Baumgart et al teach that analogous compositions provide “outstandingly suitable” multicoat clearcoats. One skilled in the art at the time of the invention would have been motivated by a reasonable expectation of providing a multicoat clearcoat from the analogous coating materials taught by Hovestadt et al.

Conclusion

Bolte et al (6,482,869), cited by applicant, disclose Norrish type I fragmenting photoinitiators that include benzophenone, Irgacure 184 and acylphosphine oxides, in column 11, line 43, to column 12, line 27.

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Gruber (4,017,652), referred to by Howard '455, also teaches the photocatalyst system comprising a combination of bimolecular and unimolecular types of initiators.

Blum et al (6,780,897) discloses Norrish type II photoinitiators, including benzophenones, benzoin, benzoin ethers and phosphine oxides, in column 21, lines 46-57.

Miller et al (4,391,686) disclose radiation curable formulations comprising a mixture of a compound that permits free radical polymerization through bimolecular photochemical reactions and an organic peroxide photoinitiator (column 3, line 44, to column 4, line 44). The photocatalyst system is added to acrylated urethanes obtained from polyisocyanates.

McDowell et al (4,224,454) disclose acyloin urethane photopolymerization initiators in combination with benzophenone as bimolecular photoinitiator useful for overcoming oxygen inhibition when photocuring in oxygen-containing atmospheres (column 5, line 56, to column 6, line 48). Example XI discloses a composition of an isocyanate compound, benzoin and benzophenone wherein the isocyanate and benzoin react to form an acyloin urethane photoinitiator mixed with benzophenone.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Susan W. Berman/ whose telephone number is 571 272 1067.

The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SB
1/27/2009

/Susan W Berman/
Primary Examiner
Art Unit 1796